Is oral health an important factor for mental health among people in custody in Scottish prisons?

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Is oral health an important factor for mental health among people in custody in Scottish prisons?

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1. Introduction

In 2005, the Scottish oral health strategy highlighted the importance of preventing dental caries for people in custody. Soon after the responsibility of oral health care shifted from the Scottish Prison Service to the National Health Service. Although, oral health has been recognised as a key area for improvement of prisoners health, the effects of psychosocial influences such as depression, drug use and dental anxiety have not been fully appreciated.

Majority of the people entering Scottish prisons test positive for drugs, those with mental health issues report substance use and have an increased prevalence of dental decay experience. Greater levels of dental anxiety and infrequent use of dental services contribute to increased untreated dental decay.

The study proposed to test a theoretical meditation model and to determine if drug use and/or dental anxiety acted as mediating factors between depression and dental decay among a sample of people in custody in Scottish prisons.

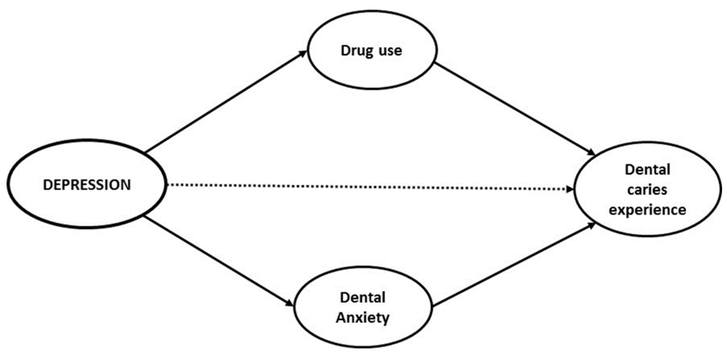

Figure 1- Hypothesised Model (doted line represents total indirect effect)

2. Methods

A convenience sample of 300 people in custody across three Scottish prisons comprising of 100 participants from each group of adult male, adult female and young offenders was gathered.

342 participants completed a questionnaire that sought information on age, gender, employment status prior to imprisonment, living and prison experiences. Depression was measured using the Centre for Epidemiological Studies Depression Scale (CES-D) with scores ranging from 0 to 60 and dental anxiety using the Modified Dental Anxiety Scale (MDAS) with a score range of 5 to 25. Three questions assessed drug use: ever taken (illegal) drugs, injecting drugs and participated in rehabilitation programme were scored as 0 (no) and 1 (yes).

The oral examination was conducted on 298 participants using the International Caries Detection and Assessment System (ICDAS) to assess carious, restored and missing tooth surfaces. Decay into dentine ($D_{3cv}T$) and missing teeth (MT) in the four quadrants ($D_{3cv}MT$) was recorded.

Ethical approval was obtained form the National Research Ethics Service (Reference Number: NRES 10/S0501/10) and the Scottish Prison Service Ethics Committee.

3. Data Analyses

The data was analysed using the SPSS v25 and Stata v16. Structural equation modelling (SEM) was conducted to test and modify the hypothesised model as a two-step approach.

In the first step, the adequacy of the measurement model was tested using the confirmatory factor analysis (CFA) and was re-specified using modification indices. In the second step, the measurement model with acceptable fit was further tested in a full SEM model. Standardised parameter estimates with their confidence intervals were calculated. Model fit was reported using a range of indices- Comparative Fit Index, Root Mean Square Error of Approximation and Tucker-Lewis Index.

In the initial model, four variables- depression, drug use, dental anxiety and dental caries experience represented by oval diagrams (Figure 1) formed the hypothetical latent constructs. Latent variable depression (CES-D) consisted of 20-item scale which on factor analysis revealed a three factor solution categorized as: negative affect, psychophysiological and positive affect. Drug use was specified by three raw variables- ever taken (illegal) drugs, injecting drugs and rehabilitation. Dental anxiety comprised five items of the MDAS scale. Dental caries experience was specified by total score of two variables: number of decayed teeth ($D_{3cv}T$) and missing teeth (MT) in each quadrant.

4. Results

The final dataset comprised of 298 participants from three Scottish prisons- 90 females, 109 adult males and 99 young offenders. The age ranged from 17 to 67 years (mean: 29.1 years). The mean CES-D score was 17.7 and 35.2% scored 16 or above suggesting depression. Females reported higher mean depression scores than males and young offenders.

The mean dental anxiety score was 10.1 and 11% scored 19 or above and were categorized as extremely anxious. Female prisoners had higher mean MDAS scores than others.

Mean number of decayed teeth ($D_{3cv}T$) was 1.4, the mean number of missing teeth (MT) was 5.9 and the mean number of decayed and missing teeth $D_{3cv}MT$ was 7.3. Adult male prisoners had higher mean number of missing teeth than female prisoners and young offenders. However, dental decay experience was higher among young offenders compared to others.

Seventy nine percent reported they had used illegal drugs and 18% reported intravenous drug use. Reported drug use was highest among young offenders (91.8%) than adult males (78.1%) and female prisoners (67%). Participation in drug rehabilitation programme was reported by 19%.

The adequacy of the measurement model was tested using CFA and was specified based on the modification indices.

The re-specified model revealed an excellent fit to the sample data (X2 [84] = 102.3, p=0.09; RMSEA: 0.03; CFI: 0.994 and TLI: 0.992) (Figure 2).

Depression predicted decayed and missing teeth through an indirect pathway via drug use and dental anxiety (Figure 2).

Therefore, 22% of the variance in decayed and missing teeth was explained by both drug use and dental anxiety. The strongest predictor was drug use (total standardised direct effect= 0.45, p<0.001).

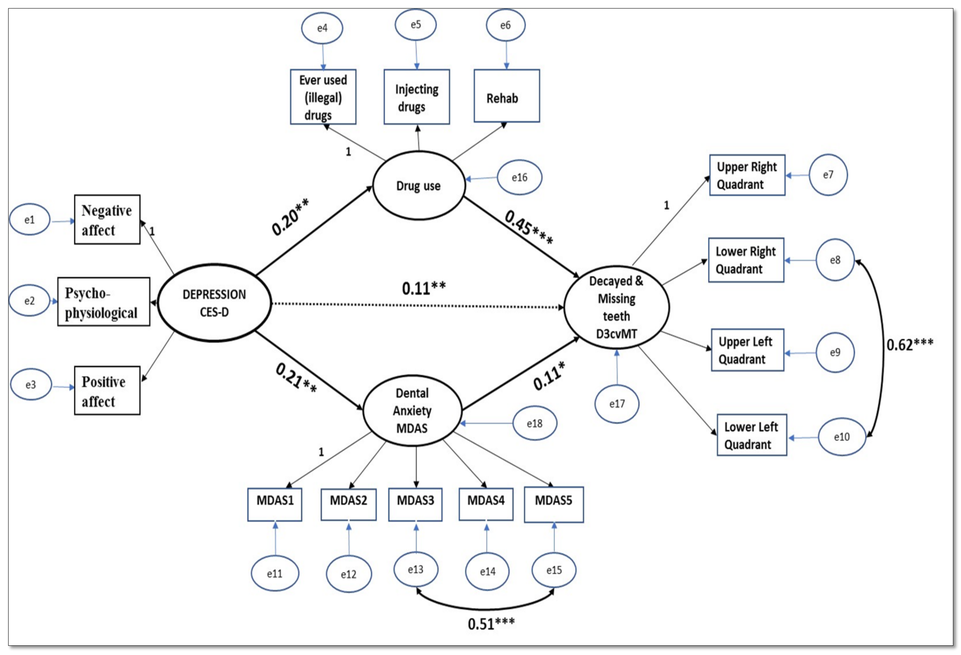

Figure 2- Path diagram showing latent (bold outline eclipses) and indicator (oblong boxes) variables and standardised parameter estimates. Dotted line with arrow indicates total indirect effects. Solid lines with arrow indicates direct effects and double arrow headed lines denote inclusion of specific correlated residual errors.

5. Discussion

This work reinforces oral health as an important factor for mental health and an integral part of prison public health, central to rehabilitation. It highlights the importance of multidisciplinary working with healthcare providers, the prison establishment and social care to ensure that the oral health and psychosocial needs of the people in custody are adequately met.

The findings of this study are therefore important for those working within the criminal justice system in Scotland and across the world.

Acknowledgements

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